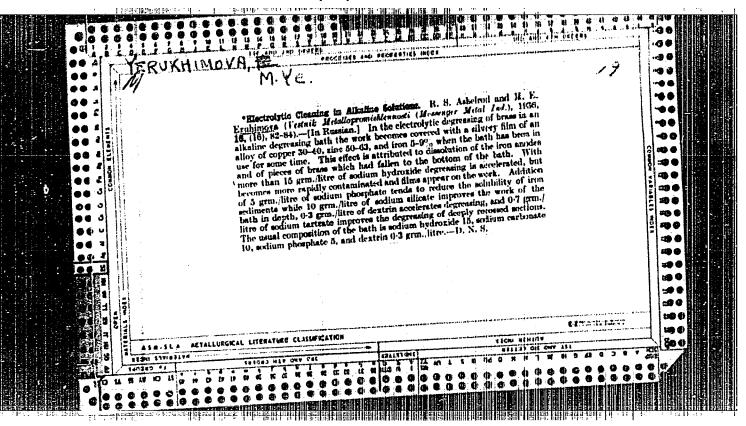


CIA-RDP86-00513R001962910017-5" APPROVED FOR RELEASE: 03/15/2001



42157

s/203/62/002/001/005/019 1023/1223

3.1800 AUTHORS:

Artem yeva, G.M., Belikovich, V.V., Benediktov, Ye.A.,

Yerukhimov, Z.M. and Korobkov, Yu.S.

TITLE:

Measurements of cosmic radioemission absorption during the solar eclipse on February 15, 1961

PERIODICAL: Geomagnetizm i Aeronomiya, v.2, no.1, 1962, 58-60

TEXT: During the solar eclipse of February 15, 1961 observations of the cosmic radioemission were made in Yevpatoriya at the following frequencies: 25, 18.6 and 13 Mes, and in Gor'kiy at 25 and 13 Mcs. Such measurements were omitted during previous eclipses. The purpose of the present measurements is to discover any decrease in the absorption of cosmic radioemission caused by the solar eclipse and to differentiate between the absorption of different layers. The apparatus used in both places was identical. The receiving antennas consisted of six wave vibrators. The maximum direction diagram was pointed to the zenith, and the width at half power was 30°. The measurements were conducted for 10-12

Card 1/3

S/203/62/002/001/005/019 1023/1223

Measurements of cosmic radioemission...

days, before and after the eclipse. Data from the five days, on which foF2 was not much different from its value on the eclipse day, were used for further analysis. The variations of the absorption during the eclipse are presented graphically. In a cor'kiy at 25 Mcs no effect was observed within experimental errors. The maximum decrease of the absorption is shifted several minutes with respect to the maximum of the eclipse. The lag is near to the value of relaxation time in the D-layer. In Yevpatoriya a second, smaller maximum, lagging by approximately 30 min, was observed. This maximum is probably connected with changes in the absorption in the F-layer, where the relaxation time is much longer than in the D-layer. The ratio of the maximum changes of the absorption in Gor'kly and in Evpatoriya is approximately equal to the ratio of the Solar zenith angles cosines. The main reason for the changes in the atsorption are changes in the electron density in the D-layer. There are 2 figures and 1 table.

Card 2/3

CIA-RDP86-00513R001962910017-5 "APPROVED FOR RELEASE: 03/15/2001

S/203/62/002/001/005/019 I023/I223

W

Measurements of cosmic radioemission...

ASSOCIATION:

Gor'kovskiy gosudarstvennyy universitet, Radiofizicheskiy Institut (Gor'kiy State University, Radiophysical Institute)

SUBMITTED:

October 25, 1961

Card 3/3

- or 02 / /		r)/FWP(t)/FTT IJP(c) JD/HD(
7.00		v)/EWP(t)/ETI IJP(c) JD/HM SOURCE CODE: UR/0125/66/00	48
AUTHOR:	German, S. I.; Yerukhir	ovich, A. A.	143
ORG: Kh	r'kov Turbine Plant im.	S. M. Kirov (Khar'kovskiy turbing	yy zavod)
TITLE:	eat resistance of the w	ilded joints of high-temperature [pearlitic alloys
	Avtomaticheskaya svarka		
allov co	S: high temperature st sposition/20KhM-L steel, 5KhllFKR-L (P-1) steel	sel, pearlitic steel, heat resist 20KhMF-L steel, 15KhlMLF-L steel	, 15km2MF2FBS-L (P-3)
ABSTRACT heat res strength softenin tures, steels	: On the basis of the ristance of welded joints of the welded joint are gof the welded metal until shown that the streetigned for prolonged of themical composition.	ewly introduced concept of the co, expressing the ratio between the data the base metal and characterizing der conditions of prolonged operates rupture strength of pearlitic teration at temperatures of up to these steels may be divided into the strength of the strength	high-temperature 600°C is a function three groups according agth of the base metal 2FBS-L (P-3) Cr-Mo-V-

L 35816-66 ACC NR: AP6015245 Nb steels (K = 0.8-0.9); and 15KhMFKR-L (P-1) Cr-Ho-V-Co-B steel (K = 0.6). The lower stress-rupture strength of the welded joints in the 2nd and 3rd groups may be explained as follows: their fracture in the near-weld zone is due to the decrease in plasticity owing to prolonged high-temperature loading; thus, the Ky of welded joints also depends on the long-time plasticity of welded joints, in addition to its dependence on chemical composition of the steel. It is shown that the stress-rupture strength of the welded joints of pearlitic high-temperature steels may be related to their hardenability, 1.e. to the depth of penetration of martensitic or troostomartensitic structure during the quenching of steel. The relative effect of the chemical composition (alloy elements) on hardenability of a steel may be evaluated according to the change in the stability of the supercooled austenite in the pearlitic and intermediate regions: the greatest effect on hardenability is exerted by B, . followed by Cr, Mo and other alloy elements. Thus, K, also depends on the hardenability of steels: it decreases with increasing hardenability, as illustrated by Fig. 1 and the following formula, where hardenability of 15kh14FKR steel is expressed by its carbon equivalent (in %): $C_{\text{equiv}} = C + \frac{Kn}{6} + \frac{Cr}{3} + \frac{N1}{4} + \frac{V}{5} + \frac{N0}{4}$

"APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R001962910017-5 (1) 1 (1) 1500 で 15 位立 標準化・株工を担づから を利用された 自知を利用を利用を表する (1) 1

ERUKHIMOVICH, A. M.

USSR/Medicine - Tuberculosis, Epidemiology

Jul/Aug 47 Medicine - Tuberculosis, Statistics

"Experiences of Field Work at Villages," G. S. Ginzburg, A. M. Erukhimovich, Ukrainian Tuberculosis Institute (Director: Prof B. M. Khmel'nitskiy), Ukrainian Roentgen Institute (Director: Ye. A. Bazlov); 12 pp

"Problemy Tuberkuleza" No 4

An account of a field trip to the kolkhoz Krasnaya Agronomiya which is located close to Krasnopavlovka Lozovskiy region of Kharkov Oblast. There has been a large patient for this kolkhoz and in 1946 there was an expedition to this area to determine the status of tuberculosis. The article is a compilation of the data which was collected.

PA 34T53

YERUKHIMOVICH, A. M.

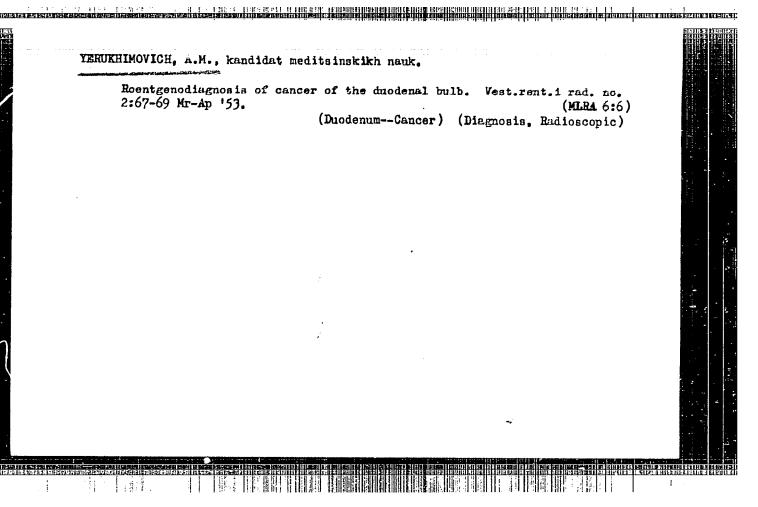
29298. Rol' i znacheniye rentgenologicheskogo issledovaniya v diagnostike khronicheskogo appenditšita. Voprosy onkologii i rentgenologii, No 1-2, 1948, s. 252-63

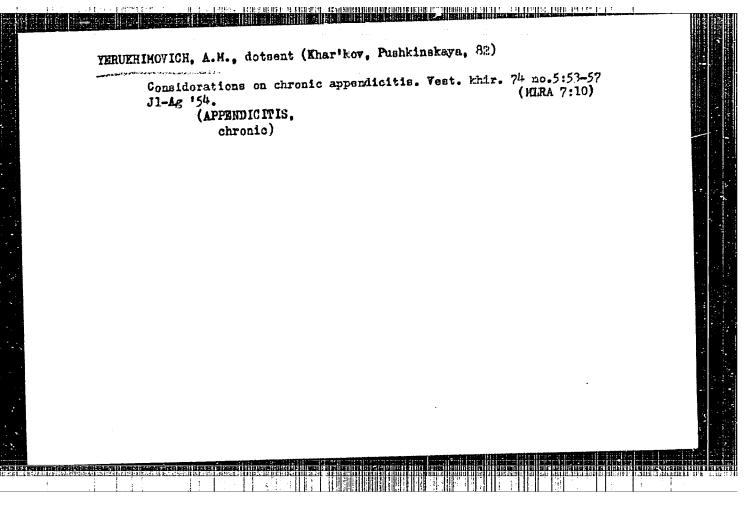
SO: Izvestiya Ak. Nauk Latviyskoy SSR. No. 9, Sept., 1955

YERUKHIKOVICH, A.M.

Roentgenologic data on the ileo-cecal region in chronic appendicitis. Ter. arkh. 23 no.1:71-79 Jan-Feb 51. (CIME 20:8)

1. Candidate Medical Sciences. 2. Of the Ukrainian Roentgen-Radiological and Oncological Institute.





USSR/General Problems of Pathology - Tumors. Tumors of Man.

υ.

Abs Jour

: Ref hur - Biol., No 21, 1958, 98275

Author

: Yeruld:inoviel: A.M.

Inst Title

: A Case of Gient Cell Tunor (Osteoclastoblastorm) of the

Toc.

Orig Pub

: Novyy khirurg. arkhiv, 1957, No 6, 73-74.

Abstract

: In a 33-year-old patient who suffered from endarteritis obliterans, there were pains in the right finger of the left foot. The third phalank of the toe was increased in size, hyperenic, tender under palpation. Roentgenologically, an absence of bone structure was noted in the diseased region. By patholistological examination of the removed phalank, a tunor was discovered which consisted of small cells of osteoclastic and osteoblastic type,

characteristic for gient-cell tumors.

Card 1/1

Clinia of Balmeslogy-Khar 'Korr Oblast' Lept . Health

YERUKHIMOVICH, A.M., kandidet mediteinskikh nauk

Interrelation between peptic ulcer and chronic appendicitis from a radiological viewpoint. ov.med. 21 no.1:96-100 Ja '57. (MLRA 10:6)

1. Is Khar'kovskoy oblastnoy bol'neologicheskoy lechebnitsy (dir. P.L.Shpak).

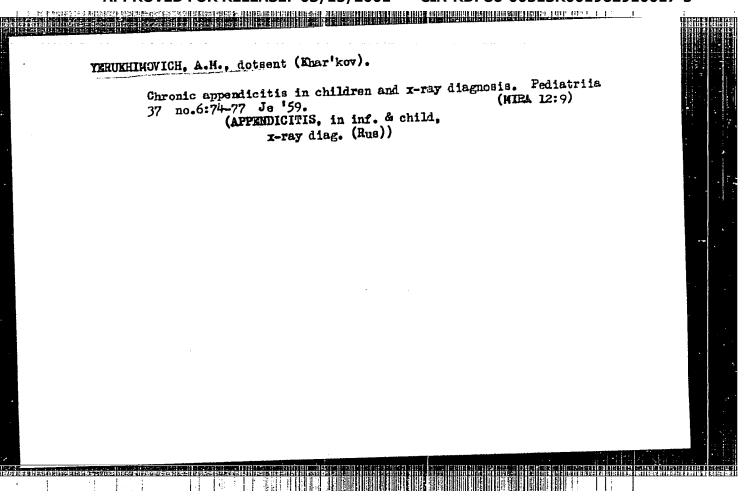
(PRPTIC ULCER, etiol. and pathogen. appendicitis, x-ray diag.)
(APPREDICITIS, compl. peptic ulcer, x-ray diag.)

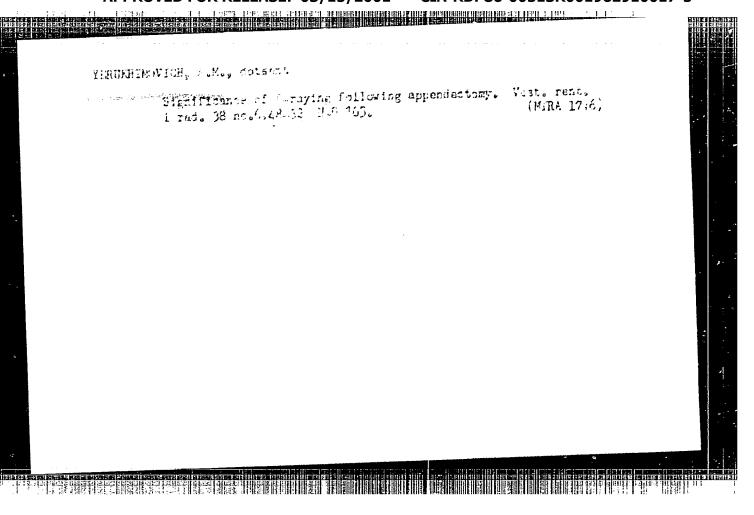
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YERUKHIMOVICH, A.M. (Khar'kov, Pushkinskaya ul., d. 82, kv. 6)

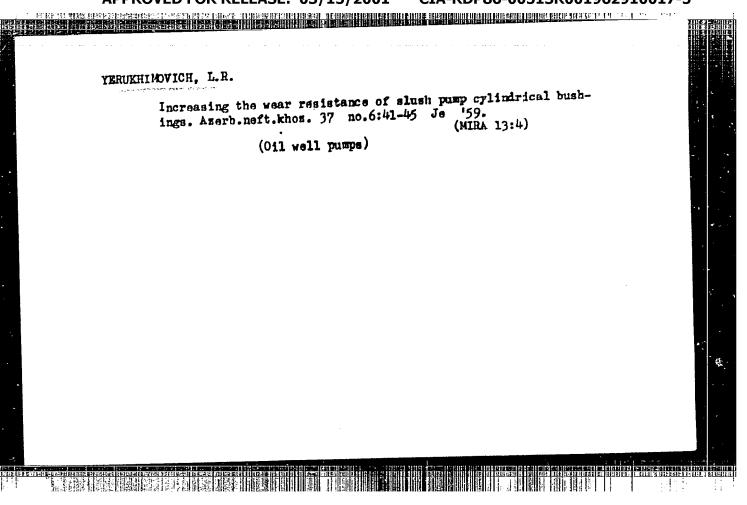
Dynamics of development and malignant degeneration of esophageal polypi. Yop. onk. 5 no.1:106-111 '59. (MHRA 12:3)

1. Iz oblastnoy kinincheskoy lechebnitsy (dir. - kand. med. nauk P. L. Shmak) Khar'kovskogo obladravotdela. (POLYPI, case reports. esophagus, malignant degen. (Rus))

(MSOPHAGUS, neoplasms, polyp, malignant degen. (Rus))
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LITVINOV, V.M.; YERUKHIMOVICH, L.R.; NIKOLAYEV, K.I.

Bench for testing the parts of drilling purps. Magh. i neft. obor.

(MIRA 17:11)

no.8:21-23 '64.

1. Grozmenskiy neftyanoy nauchno-issledovatel'skiy institut.

PODGORNEVA, A.I.; YERUKHIMOVICH, M.B., inzh.; NOVOZHILOVA, L.I., inzh.

Experience of a factory laboratory. Tekst.prom. 23 no.1:74
(MIRA 16:2)

Ja '63.

1. Nachal'nik nauchno-issledovatel*skoy laboratorii Vitebskoy
chulochno-trikotazhnpy fabriki imeni Kommunisticheskogo
internatsionala molodezhi (for Födgorneva). 2. Nauchnoissledovatel*skaya laboratoriya Vitebskoy chulochnoissledovatel*skaya laboratoriya Vitebskoy onlochnotrikotazhnoy fabriki imeni Kommunisticheskogo internatsionala
molodezhi (for Yerukhimovich, Novozhilova).

(Dyes and dyeing-Knit goods)
(Ultrasonic waves-Industrial applications)

D'YACHENKO, Petr Yakovlevich; MIROTVORSKIY, Sergey Aleksandrovich; YERUKHIMOVICH, P.L., nauchnyy red.; FRICHOVA, T.M., red.1zd-ve; GLIZHOVA, I.L., red.1zd-ve; TEMKIMA, Ye.L., tekhn.red.

[Prefabrication of precast reinforced concrete] Zavodskoe izgotovlenie sbornogo zhelezobetona. Hoskva, Gos.izd-vo lit-ry postroit., arkhit. i stroit.materislam, 1960. 281 p.

(HIRA 13:12)

(Precast concrete)

APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R001962910017-5"

YERUKHIMOVICH, P.L., kand. tekhn. nauk

Preliminary results of the study of the vibratory pressing of concrete. Trudy NIIZHB no.21:138-140 '61. (MIRA 14:12)

1. Nauchno-issledovatel'skiy institut betona i zhelezobetona Akademii stroitel'stva i arkhitektury SSSR.

(Vibrated concrete)

YERUKHIMOVICH, S.Z.

112-6-11861

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1957, Nr6; p.12 (USSR)

AUTHOR:

Yerukhimovich, S.Z.

TITLE:

Automatic High-Voltage Testing Outfit

(Avtomaticheskaya vysokovol'tnaya ispytatel'naya ustanovka)

PERIODICAL:

Informatsionno-tekhnicheskiy sbornik, Ministerstvo elektrotekhnicheskoy

promyshlennosti SSSR, 1956, NrlO, pp.37-42

ABSTRACT:

Factory testing of most flexible cords, wires, and cables include keeping them, or their semiproducts, under a certain voltage for a specified time period, then changing the voltage and keeping them up to the insulation breakdown. Most testing laboratories at cable plants use conventional h-v outfits for these tests with voltage changes and timing performed by a special worker. Deviations from the specified programs are not excluded with this system. In this connection, automation of tests seems interesting. Circuit diagrams are given, and an automatic h-v cable testing outfit is

described.

ASSOCIATION: Cable Industry Research Institute

(Nauchno-issledovatel'skiy institut kabel'noy promyshlennosti)

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CIA-RDP86-00513R001962910017-5" **APPROVED FOR RELEASE: 03/15/2001**

YERUKHIMOVICH, P.L., kand. tekhn.nauk; MADATYAN, S.A., inzh.; KLIMOVA, G.D., red.; SHEVCHENKO, T.N., tekhn. red.

[Instructions on the techniques of prestressing rod, wire, and strand reinforcement of reinforced-concrete elements by electrothermal and electro-mechanical methods]Instruktsiia po tekhnologii redvaritel'nogo napriazheniia sterzhnevoi, provelechnoi i priadevoi armatury zhelezobetonnykh konstruktsii elektrotermicheskim i elektromekhanicheskim sposobami. Moskva, Gosstroiizdat, 1962. 115 p. (MIRA 15:8)

1. Akademiya stroitel'stva i arkhitektury SSSR. Institut betona i zhelezobetona, Perovo.

(Concrete reinforcement)

s/196/62/000/002/007/023 E194/E155

AUTHOR 3

Yerukhimovich, S.Z.

TITLE:

Substitutes for copper and lead in the cable industry

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika,

no.2, 1962, 12, abstract 2B 61. (Vestn.

elektroprom-sti, no.8, 1961, 5-7).

During the period 1959-1965 the Soviet cable industry is required to save 400 000 tons of copper and 400 000 tons of TEXT: lead. Aluminium-core power cables of all sizes and voltages are now manufactured. In 1965, 90% of all cables should have aluminium cores and up to half of the output should have aluminium sheaths. Cables with aluminium cores and polyvinylchloride (PVC) sheaths should comprise 40% of the output. For cables of 1 - 35 kV insulated with PVC and polyethylene it is possible and desirable to replace their lead sheathing by PVC. Plastic-insulated and PVC-sheathed cables have been developed for voltages of 0.5, 1, 6, 10 and 35 kV. It is planned to make all control cables with non-metallic and mainly plastic sheathing, and more than 60% of them will have aluminium cores. In 1965 it is Card 1/3

Substitutes for copper and lead ... \$\frac{\$5/196/62/000/002/007/023}{\$E194/\$E155}\$

planned to replace copper cores by aluminium in 52,5% of power cables and only 5% of them will have lead sheathing. signalling and interlocking cables will be made with plastic sheathing. Electric wires for lighting and general installations in buildings will have aluminium conductors, mainly insulated with rubber, PVC and 'nairit', Work is proceeding towards the introduction of flexible aluminium-cored conductors for electrified transport and also similar conductors and cables for electric welding. Because of their lightness, conductors with aluminium cores are also important for shipbuilding and aviation. Copper may be saved by using non-metallic cores instead of copper for high-voltage ignition wiring in all kinds of automobiles. This wiring with non-metallic cores has been developed and is in series production. A study is being made of the possibility of replacing copper screening in a number of conductors and cables by various kinds of non-metallic screening materials. The cable works are manufacturing aluminium conductors insulated with enamel of vinyflex and emetalvyne

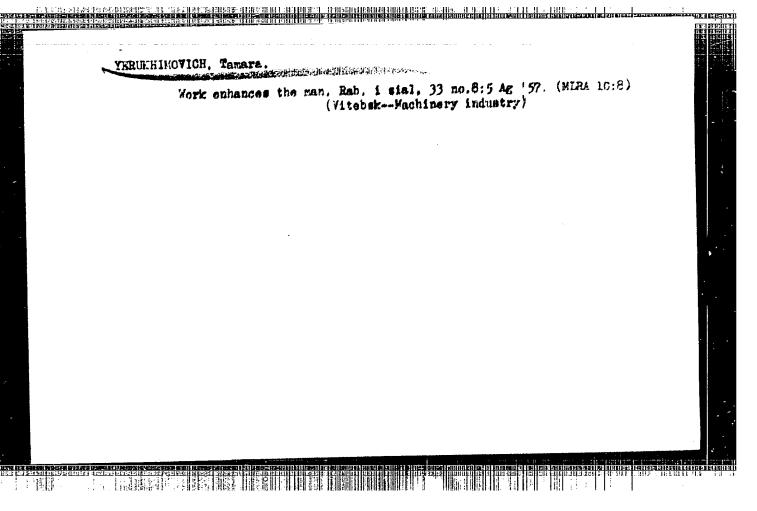
Card 2/3

APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R001962910017-5"

Substitutes for copper and lead ... S/196/62/000/002/007/023 E194/E155

(conductors grades \$\textit{7} \textit{3}\textit{8}\textit{A}\$-1 (PEVA-1) and \$\textit{1}\textit{3}\textit{A}\$-2 (PEVA-2)) and with polyamideresol enamel (\$\textit{7}\textit{3}\textit{P}\textit{A}\$-1) and \$\textit{1}\textit{3}\textit{P}\textit{A}\$-2 (PEVA-2)), and also aluminium conductors with copper insulation type \$A\textit{B}\textit{A}\textit{B}\textit{A}\textit{A}\textit{B}\textit{A}\textit{A}\textit{B}\textit{B}\textit{A}\textit{A}\textit{B}\textit{B}\textit{A}\textit{A}\textit{B}\textit{B}\textit{A}\textit{A}\textit{B}\textit{B}\textit{A}\textit{A}\textit{B}\textit{B}\textit{A}\textit{A}\textit{B}\textit{B}\textit{A}\textit{A}\textit{B}\textit{B}\textit{A}\textit{A}\textit{B}\textit{B}\textit{A}\textit{A}\textit{B}\textit{B}\textit{A}\textit{A}\textit{B}\textit{B}\textit{A}\textit{A}\textit{B}\textit{B}\textit{A}\textit{A}\textit{B}\textit{B}\textit{A}\textit{B}\textit{B}\textit{A}\textit{B}\textit{B}\textit{A}\textit{B}\text

[Abstractor's note: Complete translation.]
Card 3/3



STEBAKOV, Ye.S.; RUBTSOV, N.N., prof., doktor tekhn.neuk, leureat
Stalinskov premii, red.; YERUKHIMOVICH, TS.N., red.; ZUDAKIN,
I.M., tekhn.red.

[Specialist in removable flask molding] Formovahchik po besopochnoi formovke. Pod red. N.N.Rubtsova. Moskva, Gos.izd-vo
obor.promyshl., 1946. 83 p.

(NIRA 12:9)

ABIANTS, Viktor Khristoforovich; MITROKHIN, V.T., kand. tekhn. nauk; YERUKHIMOVICH, TS.M., red.

[Theory of gas turbines for jet engines] Teoriia gazovykh turbin reaktivnykh dvigatelei. Izd.2., perer. i dop. Moskva, Mashinostroenie, 1965. 310 p. (MIRA 18:6)

HOVIKOV, M.P.; SIVAY, A.V.; TROSHEV, A.I.; YERUKHIMOVICH, TS.M., ZU-DAKIN, I.M., tekhnicheskiy redaktor.

[Installation of airplane engines; tools] Montazh aviatsionnykh dvigatelei; montazhnye prisposobleniia. Moskva. Oborongiz, glavnaia redaktsiia aviatsionnoi lit-ry, 1947. 26? p. (MIRA 8:2) (Airplanes--Engines)

MALOV, A.N., dotsent, kand.tekhn.nauk; YERUKHIMOVICH, TS.M., red.; ZUDAKIN, I.M., tekhn.red.

[Manufacturing cartridges for small arms] Proizvodstvo patronov strelkovogo oruzhiia. Moskva, Gos.izd-vo obor.promyshl., 1947. 414 p. (HIRA 14:1)

YERUKHIMOVICH, Yu.A.; PIMENOV, Yu.V. (Moskva)

Calculation of a specific integral containing Bessel's function.

Zhur. vych. mat. i mat. fiz. 4 no.3:596-599 My-Je '64.

(MIRA 17:6)

AUTHOR: Yerukhimovich Yu. A. Hember of the SCV/1c8-13-1c-11/13
Society

TITLE: The Effect of Asymmetry in Eadiolocation Units

The Effect of Asymmetry in Eadiolocation Units on Their Performance (Vliyaniyo asimmetrii v radiopelengatore

na yego rabotu)

PERIODICAL: Radiotekhnika, 1958, Vol 13, Nr 10, pp 64 - 75 (USSR)

ABSTRACT: This is an investigation of the set-irregularities and of the smearing of the minima in multi-tower

radiolocation stations with spaced antennas, if amplitude

and phase are asymmetrical. General rules governing these phenomena are presented and the diagrams are plotted specifying the variation of the quantities mentioned, if one pair of antennas is asymmetrical, and for the radiolocation station as a whole. The kinds of irregularities which are the subject of this paper are to a high degree decisive for the accurate

operation of the radiolocation unit. Phase asymmetry is much more detrimental with respect to the occurrence of great location errors than is amplitude asymmetry.

Card 1/3 This is true in particular for the long-wave interval

of Asymmetriy in Radiolocation Units on 307/108-13-10-11/13 Their Performance

> of the frequency range in radiolocation units with a great frequency overlap. The rules governing the modification of location errors with the modulus and the rules governing the minima smearing of the radiation pattern are different with the two types of asymmetry: If a small location error corresponds to amplitude asymmetry, the accompanying smearing is relatively large. For phase asymmetry conditions are inverted. In this paper a possibility is shown of compensating that part of the set irregularity curve by introducing a corresponding controllable artificial asymmetry into the circuit of the radiolocation unit. In stationary radiolocation units this method also permits to eliminate part of the local irregularities. There are 6 figures and 5 references, 5 of which are Soviet.

SUBMITTED:

June 14, 1957 (initially) and April 21, 1958 (after

revision)

Card 2/3.

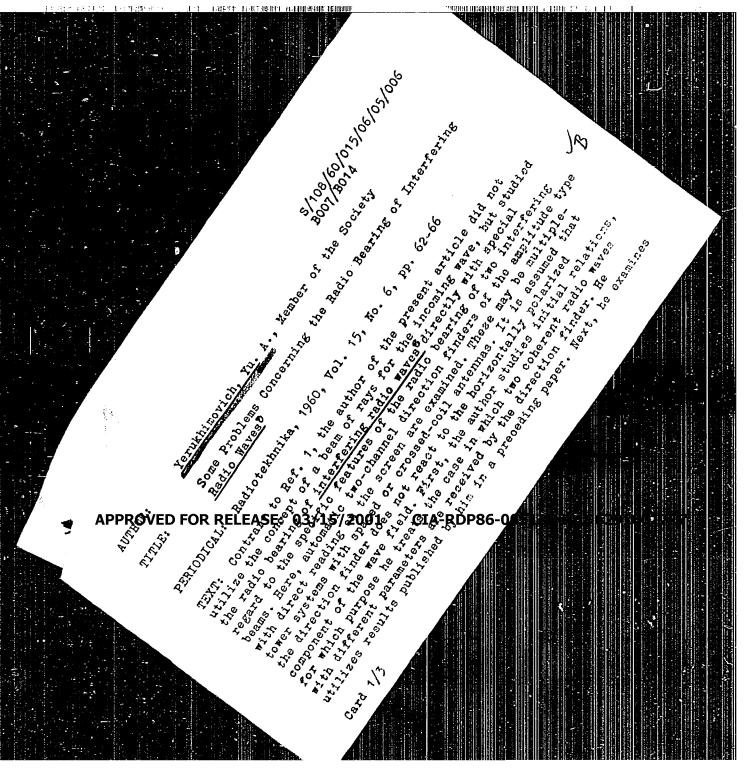
CIA-RDP86-00513R001962910017-5" APPROVED FOR RELEASE: 03/15/2001

The Influence of Asymmetry in Radiolocation Units Upon SCV/168-13-16-11/13
Their Performance

ASSOCIATION: Vsesoyuznoye nauchno-tekhnicheskoye obshchestvo radiotekoniki

i elektrosvyazi im. A.S. Popova (All-Union Scientific and Technical Society of Radio and Communications Engineering im. A.S. Popov:)

Card 3/3



S/108/60/015/06/05/006 B007/B014

AUTHOR:

Yerukhimovich, Yu. A., Member of the Society

TITLE:

Some Problems Concerning the Radio Bearing of Interfering

Radio Waves

PERIODICAL: Radiotekhnika, 1960, Vol. 15, No. 6, pp. 62-66

TEXT: Contrary to Ref. 1, the author of the present article did not utilize the concept of a beam of rays for the incoming wave, but studied the radio bearing of interfering radio waves directly with special regard to the specific features of the radio bearing of two interfering beams. Here, automatic two-channel direction finders of the amplitude type with direct reading on the screen are examined. These may be multiple-tower systems with spaced or crossed-coil antennas. It is assumed that the direction finder does not react to the horizontally polarized component of the wave field. First, the author studies initial relations, for which purpose he treats the case in which two coherent radio waves with different parameters are received by the direction finder. He utilizes results published by him in a preceding paper. Next, he examines

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Some Problems Concerning the Radio Bearing of Interfering Radio Waves

S/108/60/015/06/05/006 B007/B014

the rules governing the radio bearing of beams with constant or slowly varying parameters. Figs. 1 and 2 show a typical picture of the specific features of radio bearing for $\Delta_2=10^{\circ}$ (difference of the deviation of

the angles of incidence of the two beams from the arc of the major circle drawn between the points of emission and reception). An analysis of the formulas and figures of this article shows that considerable errors are observed both with maximum ellipticity and with a minimum of the major axis of the ellipse. Next, the author investigates the radio bearing of two stations with almost equal frequencies. On the radio bearing of such transmitters operating at the same time, an image in the form of a parallelogram appears on the screen of the tube of the two-channel direction finder. A theoretical explanation of this phenomenon is given, and an exact mathematical solution of this problem is offered in the appendix. It is shown that the difference between the frequencies of two stations, which cause this "parallelogram", follow the condition (5). On the other hand, inequality (6) must be satisfied in order that no "parallelogram" occurs. Otherwise the signals of two stations are received

Card 2/3

Some Problems Concerning the Radio Bearing of Interfering Radio Waves

S/108/60/015/06/05/006 B007/B014

as two beams from one source. Summing up: 1) Interference of two beams leads to the reception of the signals of two stations as two beams from one source, to a "parallelogram", and to "measuring of angles in sets" (krugovoy priyem). 2) The main factor of the occurrence of interference (krugovoy priyem). 2) The main factor of radio waves from the arc of the errors are the lateral deviations of radio waves from the arc of the major circle. 3) The nature of the errors under consideration is such that they cannot be completely eliminated in any case. The number of that they cannot be completely eliminated in any case. The number of erroneous readings and heavy errors in radio bearing image. 4) On the an exact analysis of the nature of the radio-bearing image. 4) On the strength of the data obtained it is assumed that, in accordance with strength of the data obtained it is assumed that, in accordance with ransmitter and in the neighborhood are mainly due to lateral deviations of radio waves. There are 4 figures and 3 references: 2 Soviet and 1 German.

SUBMITTED: November 3, 1958

Card 3/3

YERUKHIMOVICH, Yu. A., Cand Tech Sci — " Accuracy of inaction of the angular advent of radio waves in systems and the second antennas." Mos, 1961. (Min of Comm USSR. Mos Electroted Inst of Communications) (KL, 8-61, 243)

9,1300

\$/106/61/000/004/003/004 A055/A133

AUTHOR:

Yerukhimovich, Yu. A.

TITLE:

Calculation of non-linear distortions in waveguide transmission

lines

PERIODICAL: Elektrosvyaz', no. 9, 1961, 19-27

This article is a further development of Lewin's works and, in TEXT: particular, of Lewin's article (Ref. 1: "The Multiple Reflections in the Long Feeders", Wireless Eng., 1952, v. 29, No. 346). Lewin gave, indeed, an approximate solution of the problem of long feeders in the case of a large number of discontinuities M. In the present article, the author gives a precise solution of the same problem for any value of number M, within the limits of applicability of the used method. The works of Lewin are taken to be known, and various expressions, formulae and designations used by him are currently resorted to in the present article. Like Lewin, the author assumes that there are, in the waveguide (feeder), M equidistant discontinuities, their reflection factor being the same. The article consists of two parts or chapters: 1) - Calculation of harmonic interferences in waveguide lines for any number

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\$/106/61/000/004/003/004 A055/A133

Calculation of non-linear distortions...

of discontinuities: Taking as starting point Lewin's formula for the interference-power P corresponding to the q-th harmonic of the frequency ω_{a} , the author finds that the sums included in this formula can be calculated with precision for any value of M. After a comprehensive mathematical analysis, he derives, therefore, a new and more developed formula for P_0 . 2) - Noises due to non-linear transitions: After another comprehensive mathematical calculation, the author derives a general formula giving the level of the relative power (G_1^2) of non-linear-transition noises for the maximum frequency of the multichannel signal. As a numerical example, he uses this formula for the calculation of the level of non-linear-transition noises in the case of a waveguide transmission line in a typical radio-relay system. In conclusion, the author states that the results obtained by him allow to widen the possibilities offered by Lewin's method and to analyse sectionalized transmission lines containing any number of sections. He also states that the existing recommendations concerning the calculation of noises due to non-linear transitions necessitate corrections (Marko - Ref. 4: Die Berechnung der Klirrfaktoren und des Klirrgeraeusches fuer die verschiedenen Verzerrungsarten bei Vielkanal-Richtfunksystemen mit Frequenzmodulation. "NTZ", Sept. 1957, B. 10,

Card 2/3

Calculation of non-linear distortions...

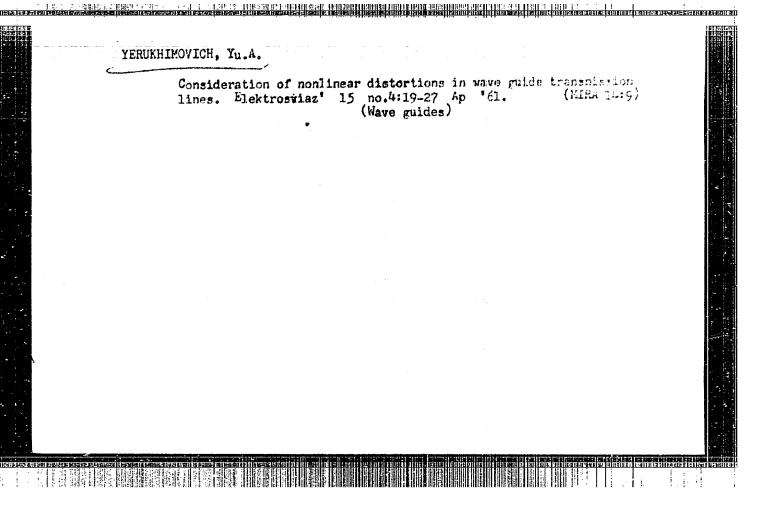
S/106/61/000/004/003/004 A055/A133

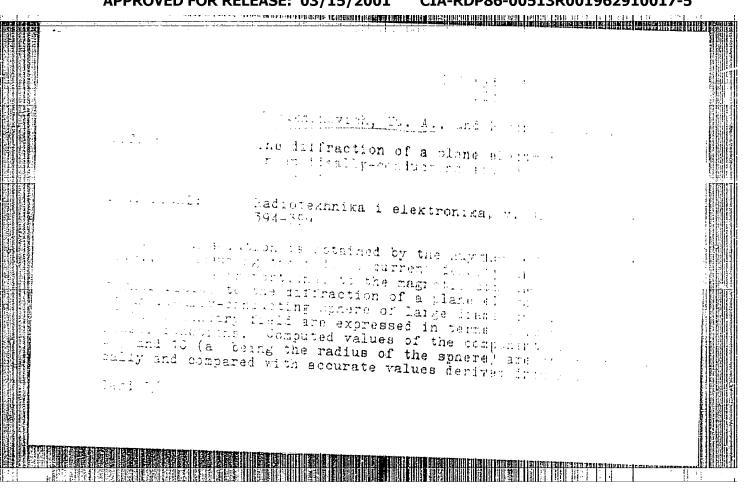
No. 9). There are 6 figures and 5 references, 3 Soviet-bloc and 2 non-Soviet-bloc. The English-language reference is: Lewin. The multiple reflections in the long feeders. "Wireless Eng.", 1952, v. 29, no. 346.

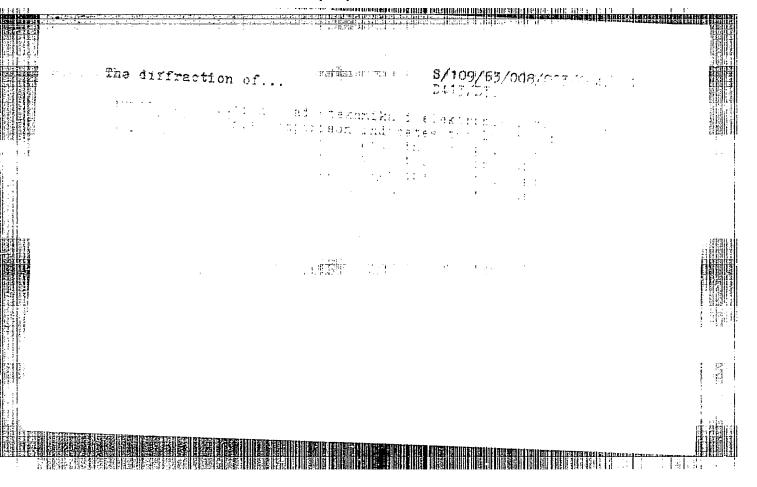
SUBMITTED: September 27, 1960

B

Card 3/3







YERUKHIMOVICH Yu.A.

Propagation of plane electromagnetic waves about the earth in the presence of horizontal reradiating lines. Radictekhnika 18 no.2815-26 F 163. (NIRA 16th)

1. Deystvitelinyy chlen Kauchno-tekhnicheskogo obshchestva radiotekhniki i elektrosvyasi imeni Popova. (Electromagnetic waves) (Antennas(Electronics)) (Radio-Antennas)

YERUKHIMOVICH, Yu.A.

Solution of a problem of the diffraction of a plane electromagnetic wave in a sphere with large diameter using an approximation method. Radiotekh. i elektron, 10 no.1:21-30 Ja 165.

(MIRA 18:2)

YERUKHIMOVICH, Yu.A.

Frequency correlation in radio communication using dispersive media. Radiotekhnika 20 no.9:27-35 18/3.65. (HIRA 18:9)

1. Deystvitel'nyy chlen Nauchno-tekhnicheskogo obshchestva radiotekhniki i elektrosvyazi imeni A.S. Popova.



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CIA-RDP86-00513R001962910017-5 "APPROVED FOR RELEASE: 03/15/2001

TERUKHMANICY, M.L. GLINKIN, N. M.; YERUKHMANOV, M.L.; ETKIN, G.S. Spravochnik Mastera Metalloobratyvayushchogo Tsekha, published by Rosgismestprom, Moscow, 1950 1118 Hills

APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R001962910017-5"

VYROV, A., inzh.; YERUNOV, I., inzh.

Our building organizations must improve their work. Sel'.stroi.
18 no.ll:7-8 N '63. (MIRA 17:3)

1. Upravleniye sel'skogo stroitel'stva Glavsrednevolzhakstroya.

5(1, 2, 3)

AUTHORS:

SOY/153-58-5-26/26 Gvozdov, S. P., (Deceased), Yerunova, A.

TITLE:

Chemical Temperature Indicators (Khimicheskiye indikatory

temperatury)

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 5, pp 154-158 (USSR)

ABSTRACT:

A simple and rapid measuring of the temperature of the surface of a heated body is of special interest in industry where the overheating of one or the other machine or its parts must not occur. As is known, for this purpose so-called heat-varying colors can be used. Although such a temperature measuring serves for orientation it can be used in industrial practice and it is accurate enough if the variation of the color may be clearly noticed and the temperature of the variation had earlied been accurately determined. In cases where other methods cannot be used the chemical temperature indicators may become irreplaceable. The task of the present paper was 1) to synthesis. compounds the variation in color of which with temperature is very marked; 2) to determine the temperature of their variation of color; 3) to devise a method of applying these compounds as

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Card 1/3

CIA-RDP86-00513R001962910017-5" APPROVED FOR RELEASE: 03/15/2001

Chemical Temperature Indicators

SOV/153-58-5-26/28

temperature indicators from 50 to 5000 in industry. Two apparatus for the determination of the variation in color were designed: a) for an informative, and b) for an accurate determination (Fig p 155). The scale of the apparatus b was checked by means of compounds the temperature dependent variation of color of which may be found in literature. The results of these determinations are given in table 1. The authors decided to regard that temperature as the temperature of the variation in color at which the variation of color takes place abruptly:
i. e. within 1-2 seconds. By means of paraffin a color pencil was produced from a corresponding color (additions of animal or synthetic fat, wax or ceresin as well as of fillers are recommended). With this pencil a line was drawn, or a point, on the surface of the test apparatus. The surface temperature was fixed by means of a millivoltmeter; the period during which the variation in color took place was measured by means of a stop-watch. Table 2 shows the variation in color of some compounds. From table 2 the dependence of the duration of the decomposition of some salts upon the temperature at which a variation of color occurs may be clearly seen. Based on this

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Chemical Temperature Indicators

also the errors may be classified which usually occur in the temperature determination of the heated surface by means of heat-varying colors. The temperatures of the color variation of many compounds were determined (Table 3) by the method mentioned. In this way a set of color pencils for temperatures of from 35 to 450° was arranged. As the fat additions, as well as the fillers, somehow displace the temperature of the color variation of the pencils, this temperature is to be determined by this method in each single case. On the paper cover of the pencil there are to be indicated the temperature as well as the type of color variation. There are 1 figure, 3 tables, and 4 Soviet references.

ASSOCIATION:

Leningradskiy politekhnicheskiy institut imeni M. I. Kalinina, Kafedra obshchey khimii (Leningrad Polytechnical Institute

imeni M. I. Kalinin, Chair of General Chemistry)

SUBMITTED:

December 16, 1957

Card 3/3

VINOGRADOVA, M.Ye.; TERUSALINCHIK, glavnyy vrach.

Certain characteristics of the course of chicken-pox under the administration of ultraviolet rays. Vop.pediat. 21 no.3:38-41 ky-Je '53.

(MERA 6:7)

1. Infektsionnaya bol'nitsa imeni S.P.Botkina.

(Chicken-pox) (Ultraviolet rays--Therapeutic use)

GRIBOV, Ye.I.; YERUSALINCHIK, A.M., inzhener, nauchnyy redaktor; SHPAYER,
A.L., redaktor; LYUDHUSKATA, B.I., tekhnicheskiy redaktor

[Roofing paper] Krovel'nyi karton. Moskva, Gos. izd-yo lit-ry po
stroit. materialam. 1956. 207 p. (MLRA 9:10)

(Roofing)

GOLUBOVICH, Aleksandr Andreyevich, inzh.; YERUSALIMCHIK, Abram Meyerovich, inzh.; ZHARENOV, Andrey Sergeyevich, inzh.; ROZEN, O.B., kand. tekhn. nauk, nauchn. red.; SOKOL'SKIY, I.F., red. izd-va; OSENKO, L.M., tekhn. red.

[The technology of bituminous roofing materials] Tekhnologiia bituminoz-nykh krovel'nykh materialov. Moskva, Gos. izd-vo lit-ry po stroit., arkhit. i stroit. materialam, 1961. 373 p. (MIRA 14:11) (Roofing, Bituminous)

IL'INSKAYA, L.A.; TOLCHINSKAYA, G.Ya.; YERUSALIMCHIK, G.L.

Characteristics of antidiphtheria immunity in children in Leningrad. Zhur.mikrobiol.epid.i immun. 33 no.5:6-10 My '62. (MIRA 15:8)

l. Iz Leningradskogo instituta imeni Pastera, sanitarno-epidemiologicheskoy stantsii Dzerzhinskogo rayona i Bol'nitsiy imeni Botkina. (LENINGRAD-DIPHTHERIA)

76-32-2-26/38

AUTHORS:

Yefimov, Ye. A., Yerusalimchik, I. G.

TITLE:

An Investigation of the Kintics of the Anodic Dissolution of Germanium (Issledovaniye kinetiki anodnogo rastvoreniya ger-

maniya)

PERIODICAL:

Zhurnal Fizicheskoy Khimii, 1958, Vol. 32, Nr 2, pp. 413-417

(USSR)

ABSTRACT:

According to the method of polarization curves and potential over time curves the kinetics in the anodic dissolution of germanium in dependence on its type of conductivity -electron- and hole conductivity - was investigated. It is shown that with current densities of more than 3.10⁻³ A/cm² the process of anodic dissolution of n-germanium is greatly different from that of p-germanium. It is assumed that the kinetics of the anodic dissolution of germanium is limited by the diffusion velocity of the positive charge carriers- the holes from the depth of the semiconductor to its surface. It is shown that with current densities of 0,15 A/cm² the

Card 1/2

An Investigation of the Kinetics of the Anodic Dissolution of Germanium

anode potential of p-germanium increased to 200 mV within 30 minutes, showing the same periodic oscillations of the potential as with n-germanium. It is assumed as not being impossible that the oxide layer at the germanium surface has semiconductor properties itself, which complicates the process investigated here. Summarizing it is stated that an investigation of the electrochemical reaction of germanium without taking into account the type of conductivity and the electric parameters can not furnish a correct picture of the processes investigated. There are 4 figures, and 5 references.

SUBMITTED:

December 3, 1956

1. Germanium-Electrochemistry

Card 2/2

AUTHORS:

Yefimov, Ye. A., Yerusalimchik, I. G.

76-32-5-24/47

TITLE:

The Effect of the Electrophysical Properties of Germanium on the Process of Its Anodic Dissolution (Vliyaniye elektrofizicheskikh svoystv germaniya na protsess yego anodnogo rastvoreniya)

PERIODICAL:

Zhurnal fizicheskoy khimii, 1958, Vol. 32, Nr 5, pp. 1103-1106

(USSR)

ABSTRACT:

Since the kinetics of the process depends on the diffusion of the holes to the surface of the semiconductor it is to be expected that the magnitude of the specific resistance of germanium and the diffusion length also exert an influence on the course of the anodic process, so that in the present work this is investigated with respect to p- and n-types of Polarization curves were plotted by means of an already described plant and method, in which case it was

especially clearly observed with the increase of the resistance of the n-type of the germanium that an essential decrease of polarization takes place, while in the case of the n-type the effect is essentially smaller and has a reverse character. In the case of higher specific resistances the difference between

Card 1/2

The Effect of the Electrophysical Properties of Gernanium 76-32-5-24/47

the polarization curves of the two types is small, which is explained by the assumption that the kinetics of the anode dissolution of germanium at current densities of above 3.10-3 A/cm² is determined by the diffusion velocity of the carriers with positive charge - the holes from the depth of the semiconductor to its surface; this is proved by the data on the influence of the temperature on the shape of the anode polarization curves. From the experimental results on the influence of the diffusion length can be seen that with the above mentioned current densities the same effect was observed as in the case of the specific resistance, but that it is smaller. On the mentioned conditions a decrease of the saturation current of the holes in the crystal will lead to an increase of the polarization with the increase of the diffusion length with equal current densities, which is in agreement with the obtained experimental data. There are 4 figures and 2 references, 2 of

SUBMITTED:

January 29, 1957

Card 2/2

1. Germanium--Electrical properties 2. Germanium--Physical properties 3. Germanium--Electron transitions

AUTHORS:

Yemifov, Ye. A., Yerusalimchik, I. G.

sov/76-32-9-6/46

TITLE:

A Study of the Hydrogen Overvoltage on Germanium (Issledovaniye

perenapryazheniya vodoroda na germanii)

PERIODICAL:

Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 9,

pp 1967 - 1970 (USSR)

ABSTRACT:

The authors investigated the deposition of hydrogen on germanium from a 0,1 N solution of HCl at 200. The polarization curves for current densities between 10-5

and 10-1 A/cm2 were drawn (Figs 1-4). In addition to the pure hydrochloric acid solution (polarization curves in figure 1) the authors employed hydrochloric acid solutions with the following compounds added: sodium

citrate (polarization curve in figure 2); tetraethyl ammonium iodide (polarization curve in figure 3); and octyl alcohol (polarization curve in figure 4). The authors found that the overvoltage of hydrogen on

germanium is high, lying between -0,5 and -1,2 V., and that at current densities of 10⁻⁵ to 10⁻³ and 10⁻² to 10⁻¹

Card 1/2

the overvoltage follows the equations: $\eta = 0.97 + 0.12 lg I$

CIA-RDP86-00513R001962910017-5" APPROVED FOR RELEASE: 03/15/2001

A Study of the Hydrogen Overvoltage on Germanium

507/76-32-3-6/46

and h= 1,33 + 0,12 lg I (I is the current density in amperes per quarter centimeter). The kind of conductivity of the germanium cathode has no influence on the deposition of the hydrogen (Fig 1). All results show that the electro-chemical deposition of hydrogen on germanium takes place according to a mechanism of delayed discharge; this conclusion agrees completely with the theory of A.N. Frumkin (Ref 5). There are 4 figures and 10 references, 6 of which are Soviet.

SUBMITTED:

March 27, 1957

Card 2/2

5(4)

50V/20-122-4-26/57

AUTHORS:

Yefimov, Ye. A., Yerusalimchik

TITLE:

A Germanium Electrode With a p-n-Transition (Germaniyevyy elektrod s p-n-perekhodom)

PERIODICAL:

Doklady Akademii nauk SSSR, 1950, Vol 122, Nr 4, pp 632-634

(USSR)

ABSTRACT:

According to the results of some revious papers (Refs 1, 2), the anodic dissolution of germani m depends on the concentration of the holes on the surface of the semiconductor. It was interesting, therefore, to investigate the behavior of a germanium electrode with a p-n-transition. By means of such a transition, holes could be injected and a region of a reduced content of carriers could be formed. The experiments described in this paper were carried out on a plate of germanium of the electron conductivity type (specific resistance 20 Ohm.cm,

diffusion length 1 mm). The initial thickness of the plate was 250 μ . The carrying out of the experiments is discussed in a few lines. A diagram gives the polarization curves for the anodic dissolution of germanium found for the current

Card 1/3

density interval

A Germanium Electrode With a p-n-Transition SOV/20-122-4-26/57

 $10^{-6} - 10^{-2}$ A/cm². The second diagram given the variation of the potential of the germanium anode if the positive pole of the current source is connected with an Ohmic ring contact, and if the external circuit of the p-n-transition is disconnected. It is expected that the injection of the holes into the germanium will diminish the polarization of the electrode reaction. In thin germanium plates (for current densities $I > 10^{-3} \text{ A/cm}^2$) the anodic dissolution proceeds with a higher polarization than in thick germanium plates. An increase of the return displacement (ureturn) may extend the region of the space charge to such an extent that it reaches the germanium surface which is in contact with the electrolyte. In order to investigate the behavior of the electrode under such conditions, the authors measured its potential and its capacity for a frequency of 5000 cycles and for various return displacements on the p-n-transition. If u_{return} increases to 15 - 20 V, the capacity of the electrode decreases sharply. However, the potential of the electrode does not vary up to ureturn = 15 - 20 V, and it grows slowly above this value. If the space charge reaches the surface of the germanium plate, the selfdissolution of germanium becomes slower because of a

Card 2/3

A Germanium Electrode With a p-n-Transition

SOV/20-122-4-26/57

lack of holes, and the potential of the electrode becomes higher. There are 2 figures and 3 references, 1 of which is

Soviet.

PRESENTED:

May 23, 1958, by A. N. Frumkin, Academician

SUBMITTED:

May 21, 1958

Card 3/3

APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R001962910017-5"

5(4) AUTHORS:

Yefimov, Ye. A., Yerusalimchik, I. G.

SOV/76-33-2-32/45

TITLE:

An Investigation of the Capacity of the Germanium Electrode

|PERSONS BLECTER OF THE THE PROPERTY OF THE P

(Issledovaniye yemkosti germaniyevogo elektroda)

PERIODICAL:

Zhurnal fizicheskoy khimii, 1950, Vol 33, Nr 2,

pp 441 - 446 (USSR)

ADSTRACT:

The method of curves of differential capacity makes possible a determination of the zero point of the electrode

metal as well as jiving information on the condition of the electrode surface. The single paper which reports a

electrode surface. The single paper which reports a measurement of the capacity of the germanium electrode is that of Bohnenkamp and Engel (Bonenkamp)(Ref 1). In the present paper the measurement was carried out according to the method described by M. A. Proskurnin and A. N.

Frumkin (Ref 2), A GSNCh-99I generator, a bridge connection constructed on the basis of the universal RFT bridge, and a LV-9-2 lamp voltometer were used. The anodic measurements took place in a nitrogen atmosphere and the cathodic in a hydrogen atmosphere. Before each curve determination the

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electrode was polished and cleaned in SR-4 mordant. According

An Investigation of the Capacity of the Germanium Electrode SOV/76-33-2-32/45

to the equation of R. M. Vasenin (Ref 4) the zero charge for germanium is 0.34 volt and according to the calculation data of Ye. A. Ukshe and A. I. Levin (Ref 5) it is 0.63 (-0.47) volt. In the work reported here the measurements were carried out in 0.1 n hydrochloric acid at frequencies of 60, 200 and 1000 hertz. The C-Vacurves for germanium of p-type (Figs 1,2) and for monocrystals of germanium of the electron type (n-type) show a sharp minimum at 0.6 volt. This value is close to that of (Ref 5) but much lower than that calculated from the equation of Vasenin. Curves were plotted for the differential capacity for germanium of the p and n-types at current densities of about 10-5 - 10-1 ampere/cm² in 0.1 n hydrochloric acid and at frequencies of 200, 1000, and 5000 hertz (Figs 3-5). These curves showed several differences in that there was a dependence shown upon the type (n- or p-) and upon the size of the specific resistance of the Ge. A polarization at potentials somewhat above 0.5 volt led to the formation of spots (yellow-brown color) on the germanium anode, which was attributed to the formation of a phase oxide of the type GeO. There are 6 figures and 7 references, 6 of which are Soviet.

Card 2/3

5(4) 507/20-124-3-33/6? Yefimov, Ye. A., Yerusalimchik, I. G. AUTHORS: The Investigation of Electrode Reactions on a Silicon Cathode TITLE: (Issledovaniye elektrodnykh reaktsiy na kremniyevom katode) Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 3, pp 609-612 PERIODICAL: (USSR) By employing the method of polarization measurement the authors ABSTRACT: investigated the electronic separation of hydrogen and the reduction of potassium ferricyanide on monocrystalline silicon of the p- and n-type orientated in the direction 111. These investigations were carried out at current densities of from 10^{-6} to 10^{-1} a/cm² at t = 20° . The method of experimental investigation has already been described (Ref 6). The ohmic contacts with silicon were established by the electrolytic application of rhodium. By a previous treatment of silicon in boiling KOH (5-10%) the same results were obtained. A hydrogen electrode was used in the acid solutions for purposes of comparison, and in basic solutions a saturated calomel half-element was used for the same purpose. A diagram shows the dependence of the overpressure of hydrogen on the logarithm of Card 1/3

The Investigation of Electrode Reactions on a Silicon Cathode

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current density in 2n H2SO4 on silicon of the p- and n-type with different specific resistance and with a life of the unreal current carriers of 30-40 usec. All curves in the interval of current densities of 10⁻⁶ to 10⁻⁴ a/cm² are practically in agreement and have a coefficient of inclination of b = 0.18. However, at higher current densities this agreement ceases. For in KOH the curves are of similar character. All curves shown in the diagrams were determined with the electrolyzer completely darkened. The course taken by the curves of hydrogen overpressure for silicon differs considerably from the analogous curves for germanium. According to the authors opinion, the difference in the course taken by the curves of hydrogen on silicon of the p- and n-type in 2n H2SO4 is due to the ohmic voltage drop in the impoverished layer of the semiconductor. For the purpose of confirming this assumption, the authors determined the differential capacity of the silicon electrode at a frequency of 200 cycles. The greatest ohmic voltage drop must occur with silicon of the potype. The decrease

Card 2/3

APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R001962910017-5"

The Investigation of Electrode Reactions on a Silicon Cathode

507/20-124-3-33/57

of hydrogen overpressure on p-type silicon at 100-200 mv under the effect of light tends to show that certain difficulties exist in connection with conveying the supply of electrons from the interior of the semiconductor to its surface. This is, however, not the only reason for hydrogen overpressure. According to the experiments carried out by the authors the influence of the semiconductor properties of the cathode upon the kinetics of electrochemical reactions manifests itself in a different manner in the case of different reactions. The more electrochemical polarization of the reaction on the cathode decreases, the more distinctly will the influence exercised by the semiconductor properties of the electrode material manifest themselves. There are 4 figures and 6 references, 2 of which are Soviet.

PRESENTED:

September 11, 1958, by A. N. Frumkin, Academician

SUBMITTED:

September 10, 1958

Card 3/3

CIA-RDP86-00513R001962910017-5 "APPROVED FOR RELEASE: 03/15/2001

SOY/20-128-1-33/58 5(4)

AUTHORS: Yerusalimchik, I. G. Yefimov, Ye. A.,

On Particular Features of Electrolytic Oxidation Reactions TITLE:

on a Germanium Anode

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 1, pp 124-126

(USSR)

It is an established fact that the kinetics of the anodic ABSTRACT:

dissolution of n-germanium is limited by the diffusion of the holes from the interior of the semiconductor to the surface (Refs 1-5). A similar influence of the semiconductor properties was therefore to be expected also for other anodic reactions. The electrolytic oxidation of bivalent vanadium on a rotating n-germanium anode, however, showed (Ref 6) that the V^{2+} -ions are oxidized without any restriction in that potential range in which the dissolution rate of germanium is limited because of the lack of holes. The question was therefore investigated as to whether in this case a specific behavior of vanadium ions is concerned, or whether this phenomenon occurs also with other oxidations. An investigation was carried out of the oxidation of the oxalate anions

Card 1/4 and of iodine. Figure 1 shows the dependence of the potential

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On Particular Features of Electrolytic Oxidation Reactions on a Termanium Anode

(referred to normal hydrogen electrode) on the current density of an n- and p-germanium anode with a specific resistivity of 1.5 ohm cm and a diffusion length of 0.4 - 0.5 mm. The introduction of potassium oxalate into the solutions decreases the potential of n-germanium. This phenomenon is particularly marked in the case of high current densities at which, for the anodic dissolution of the n-Ge the limiting current of the diffusion of the holes occurs. By the addition of the oxalate ion this limiting current vanishes. The oxidation of the oxalate, which occurs simultaneously with the dissolution of the Ge, increases the latter within the potential range, in which it is otherwise limited by diffusion of the holes to the surface of the semiconductor. The inpression is conveyed that the anodic oxidation of c_2^{2-} increases the concentration of the holes on the surface and thus facilitates dissolution. This is explained by the authors by the fact that the oxidation of the oxalate ion is not due to the holes but to the penetration of electrons

Card 2/4

SOV/20-128-1-33/58

On Particular Features of Electrolytic Oxidation Reactions on a Germanium Anode

into the Ge-anode. In the case of p-Ge the lowering of the potential by oxidation of the oxalate ion occurs only at low current densities. If current densities are higher, an anodic dissolution of Ge, which is not influenced by the presence of the $C_2O_4^{2-}$ occurs. In a similar manner the oxidation of KJ (Fig 2) develops. Here a further process is added, which accelerates the anodic dissolution of Ge, viz. the reduction of J on the anode by the capture of electrons from the valence zone. This reduction could also be visually confirmed because the discoloring of the solution, which is characteristic of iodine, did not occur. Iodine in this case probably plays the part of a current carrier and promotes the exchange of electrons between the valence zone and the zone of conductivity. Herefrom the authors draw the following conclusions: Only the reaction of the anodic dissolution of Germanium, which is connected with the destruction of the crystal lattice, is limited by the diffusion of the holes to the surface. Other oxidation reactions develop without the assistance of the holes, but by the penetration of electrons into the anode. There are 2 figures and 8 references, 4 of which are Soviet.

Card 3/4

YERUSALIMONIK, I. G., Cana Chem Sci — (diss) "Kinetics of electrochemical reactions on a germanium electrode," Loscom; 1960, 8 pp (Enstitute of blectrochemistry, AS USSE) (KL, 35-60, 123)

S/076/60/034/012/017/027 B020/B067

AUTHORS:

Yefimov, Ye. A. and Yerusalimchik, I. G., Moscow

TITLE:

Hydrogen Evolution on a Germanium Cathode

PERIODICAL:

Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 12,

pp. 2804-2807

TEXT: In contrast to the results obtained by W. Brattain and C. Garrett (Ref. 1) the authors found no difference in the course of the polarization curves (η-logI) which were taken on p- and n-type germanium at current densities of 10-5 to 10-1 a/cm² after previous long-lasting polarization (Ref. 2). The authors attempted to study the reasons of the absence of (Ref. 2). The authors attempted to study the reasons of the absence of the curves potential - current were taken by a quick method which permitted the polarization measurements to be made at a low hydrogen overvoltage. In the experiments the voltage was applied to the electrolyzer by a special generator of sawtooth pulses which allowed the voltage supply to be changed from 30 to 10-4 sec. The potential of the germanium electrode was measured in 0.1 N HCl at current densities of 10-3 to 3.10-2 a/cm² Card 1/3

Hydrogen Evolution on a Germanium Cathode

5/076/60/034/012/017/027 B020/B067

and 20° as referred to a hydrogen electrode in the same solution (Fig. 1). Curve 1 corresponds to n-type germanium and curve 2 to p-type germanium. The curves were taken within three seconds. At a potential more negative than 0.6 v the curves η - I for n- and p-type germanium cathodes diverge. At $I = 5.10^{-2}$ a/cm² the polarization of the polarization o increases by 0.3 v compared to that of n-type germanium. When measuring the potential after preceding cathodic polarization of the electrode to a constant potential no deviation was found between the curves of patype and n-type germanium. The difference in the kinetics of the electrolytic evolution of hydrogen on p- and n-type germanium becomes manifest only at current densities exceeding 3.10^{-3} a/cm² and in a very short initial range. This phenomenon is connected with the bending of the energy zones on the semiconductor surface during adsorption and the entrance of the hydrogen atoms into the crystal lattice. Fig. 2 shows the ϕ - I curves for a solution of 0.1 N HCl + 0.1 N (NH_A) 2S208 which were taken within three seconds on n-(curve 1) and p-(curve 2) type germanium, whereas curve 3 corresponds to the hydrogen evolution in 0.1 N HCl on n-type germanium. At current densities exceeding 10^{-1} a/cm² the potential of the p- and

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n-type germanium electrode rose strengly and anomalously (Fig. 3). This was not the case in degenerate semiconductors because of their ohmic fall of potential in the impoverished layer on the germanium surface and in the semiconductor mass. The electron diffusion from the mass of p-type germanium to its surface reduces the rate of electrochemical reaction neither in hydrogen evolution nor in the reduction of the persulfate ion. There are 3 figures and 8 references: 3 Soviet, 3 05, and 2 British.

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\$/076/61/035/002/011/015 B107/B220

AUTHORS:

Yefimov, Ye. A. and Yerusalimchik, I. G. (Moscow)

TITLE:

Anodic dissolution of silicon in hydroffuoric acid

PERIODICAL:

Zhurnal fizicheskoy khimii, v. 35, no. 2, 1961, 384-388

TEXT: The process of anodic dissolution of p-type and n-type silicon with specific resistance of about 10 Q cm in 2.5 N hydrofluoric acid at 20°C has been studied. The investigation is of practical interest for the electrochemical etching of silicon. The silicon samples tested were toward (111); the minority carriers have an average lifetime of 30-40 μsec. Polarization and differential capacity were measured referred to a saturated calomel electrode; the potential-versus-time curves were measured with an 3HO-1 (ENO-1) oscilloscope. The method has been described by the authors in a previous paper on the dissolution of germanium (Zh. fiz. khimii, 33, 441, 1959). Fig. 1 shows the potential for anodic dissolution at current densities between 10-0 and 10-2 A/cm². n-type silicon shows a clearly marked limiting current which is still increased by adding potassium ferricyanide to the

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s/076/61/035/002/011/015 B107/B220

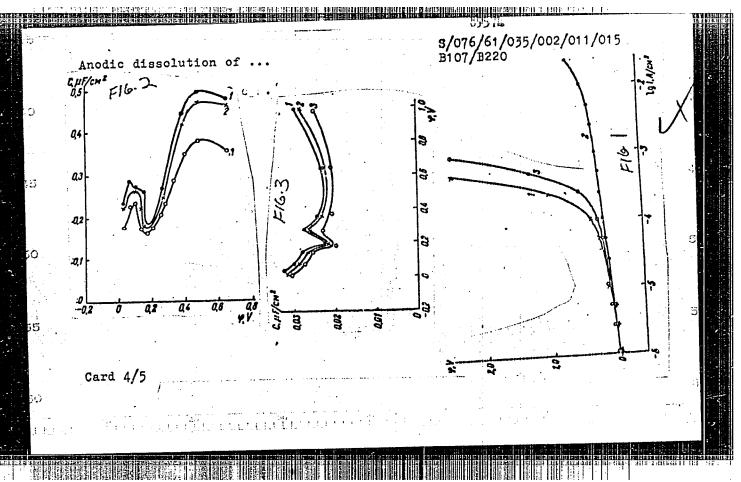
Anodic dissolution of ...

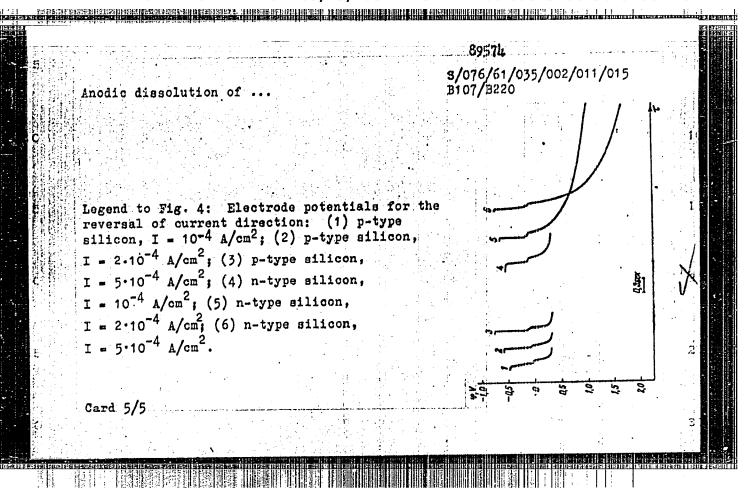
solution. For p-type silicon, however, φ is a linear function of log I between 10^{-6} and $5 \cdot 10^{-3}$. It follows therefrom that the dissolving process is determined by the number of holes at the silicon-electrolyte interface. The dissolution causes the formation of an oxide layer which is dark on p-type silicon and dissolves hardly in concentrated hydrofluoric acid, but with vigorous evolution of hydrogen in cold potassium hydroxide. The oxide layer on n-type silicon is much thinner and reacts hardly with potassium hydroxide, but is dissolved in concentrated hydrofluoric acid. Apparently, the oxide layer on p-type silicon consists mainly of bivalent, and that on n-type silicon of tetravalent silicon compounds. Differential capacity was measured at 200, 1000, and 10,000 cps. (Figs. 2 and 3); the curves correspond to those for germanium, but the capacity is lower. For p-type silicon it is about one order of magnitude higher than for n-type silicon; this is due to the fact that in the latter the impoverished carrier band is broader. The change of the electrode potential after reversing from cathode to anode direction is shown in Fig. 4. Conclusions: The first stage of anodic dissolution is the electrochemical oxidation of the electrode surface; then, the hydrofluosilicic compounds formed on the surface enter the solution; this process

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5/076/61/035/002/011/015 B107/B220 Anodic dissolution of ... is, however, limited by the number of holes at the semiconductor-electrolyte interface. If there is an insufficient number of holes (as in the case of n-type silicon), the dissolution of the silicon oxide compounds formed on the surface is rendered difficult and electrochemical oxidation of the electrode surface continues unimpeded. Probably, this is the reason why tetravalent and bivalent silicon compounds are formed on n-type and p-type silicon, respectively. There are 4 figures and 5 references: 1 Soviet-bloc and 4 non-Soviet-bloc. The references to the three English-language publications read as follows: Uhlir, Bell System Techn. J., 35, 333, 1956; Turner, J. Electrochem. Soc., 105, 402, 1958, Flynn, J. Electrochem. Soc., 105, 715, 1958. SUBMITTED: June 10, 1959 Legend to Fig. 1: Anode polarization in the dissolution of silicon: (1) n-type silicon in 2.5 N HF; (2) p-type silicon in 2.5 N HF; (3) n-type silicon in 2.5 N HF + 0.05 N K_3 Fe(CN)6. Legend to Fig. 2: Differential capacity for p-type silicon: (2) 1000 cps; (3) 10000 cps. Legend to Fig. 3: Differential capacity for n-type silicon: (1) 200 cps; (2) 1000; (3) 10,000 cps. Card 3/5

"APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R001962910017-5





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sor/20-130-2-31/69

AUTHORS:

Yefimov, Ye. A., Yerusalimchik, I. G.

TITLE:

On the Particular Features of the Electrochemical Dissolu-

tion of n-Type Silicon 1

PERIODICAL:

Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 2,

pp 353 - 355 (USSR)

ABSTRACT:

This paper is an experimental confirmation of the assumption made by J. Flynn (Ref 4), according to which, un. like what is the case with germanium, mainly the holes are used up in the electrochemical dissolution of Si which are formed in the space charge layer on the boundary between semiconductor and electrolyte, and where only an insignificant number of holes is formed by generation within the semiconductor. The method employed is described in reference 3. The experiments were made by means of an n-silicon lamella (resistivity about 3 ohm.cm). On one side of the lamella a p-n junction with an area of 0.03 cm2 was produced by melting aluminum, and on the same side an ohmic contact was connected. The lamella was insulated by means of silicon-varnish and paraffin with the exception of the

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On the Particular Features of the Electrochemical SOV/20-130-2-31/69 Dissolution of n-Type Silicon

place opposite the p-n junction. The thickness of the n-Si layer between the boundary of the p-region and the electrolyte was 20-25 to. The experiments were made at 20° in 25n HF. Figure' 1 shows the polarization curves of the anodic dissolution of Si in the interval of current densities from 10-6 to 5.10-4 a/cm2. Curve 1 was obtained with an open circuit of the p-n junction and connection of the positive pole of the current source to the chmic contact. Curve 2 was obtained by connection of a back bias of 100 v to the p-n junction, Both curves are in full agreement. For comparison, curves are introduced, which were obtained with ordinary Si-electrodes with a specific resistance of 3 ohm.cm and 10 ohm.cm. The change in electrode thickness in the case of the same specific resistance exerts no influence on the anodic dissolution of Si, which is in contradiction to the results obtained with germanium (Ref 3). Thus it has been proven that the holes necessary for the anodic dissolution of Si are essentially formed within the region of the space charge on the boundary

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On the Particular Features of the Electrochemical SOV/20-130-2-31/69 Dissolution of n-Type Silicon

between semiconductor and electrolyte, but not within the semiconductor. A further confirmation of this opinion was provided by the experiments made with reduced $(c_2o_4^{2-})$ and oxidizing $(K_3Fe(CN)_6)$ -additions to the electrolyte (Refs 6.7). There are 1 figure and 7 references, 3 of which are Soviet.

PRESENTED:

September 8, 1959, by A. N. Frumkin, Academician

SUBMITTED:

September 8, 1959

W

Card 3/3

8/020/60/134/006/023/031 B004/B054

AUTHORS:

Yefimov, Ye. A. and Yerusalimchik, I. G.

TITLE:

Investigation of the Surface State of Anodically Polarized

Germanium in Alkaline Solutions

PERIODICAL:

Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 6,

pp. 1387-1389

TEXT: The authors studied the state of anodically polarized germanium by recording the curve of charge. To exclude semiconductor effects, they used degenerate polycrystalline germanium. The experiments were made in 0.1 N KOH at 20 C. The germanium electrode was anodically polarized at various current densities for a certain period. Then, the curve of charge was recorded at a current density of 10⁻³ a/cm² by means of an ∋H0-1 (ENO-1) oscilloscope. Fig. 1 shows the curves of charge after anodic polarization at the potentials -0.350 v and -0.330 v, and a duration of 10.20; 60, and 120 sec. In all cases, the authors observed, at about -0.75 v; a retardation of the potential increase which is due to the oxygen discharge on the germanium surface. In anodic polarization $\varphi = -0.35 \text{ v}$, the amount of electricity needed is about 4.5.10-4 coulomb/cm2, and does Card 1/3

CIA-RDP86-00513R001962910017-5" APPROVED FOR RELEASE: 03/15/2001

Investigation of the Surface State of Anodically Polarized Germanium in Alkaline Solutions S/020/60/134/006/023/031 B004/B054

not depend on the time of polarization. The potential of about 1.4 v corresponds to the potential of hydrogen separation on a pure germanium surface in 0.1 N KOH at I = 10^{-3} a/cm². The amount of chemically adsorbed oxygen depends on the potential of anodic polarization. It is completely eliminated by cathodic polarization at 4 4 -0.35 v. With an increase in the potential to -0.330 v, a horizontal step appears in the curve of charge at $\psi \approx -0.75$ v. The total amount of electricity needed to remove the exygen-rises by one order of magnitude, and now depends on the duration of the preceding anodic polarization $(10^{-5} \text{ coulomb/cm}^2 \text{ at } \tau = 10 \text{ sec},$ $7 \cdot 10^{-3}$ coulomb/cm² at $\tau = 120$ sec). The observed step makes the authors conclude that with anode potentials higher than -0.35 v, part of the electrochemically adsorbed oxygen is bound more closely to the surface. A monomolecular GeO layer is formed. Fig. 2 shows that the retardation at $\psi = -0.75$ v can only be observed at anodic potentials below $\psi = -0.180$ v. At higher potentials or after longer polarization, the horizontal step disappears. Fig. 3 shows the curve of charge at anodic polarization with $I = 2.5 \cdot 10^{-2} \text{ a/cm}^2 (\varphi = -0.03 \text{ v})$. After longer duration of polarization, the potential of the electrode rises to +0.6 v due to slow diffusion Card 2/3

Investigation of the Surface State of Anodically Polarized Germanium in Alkaline Solutions

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of OH ions to the electrode surface, and a new retardation appears on the curve of charge at $\psi = -0.25$ v. The experimental data show that the total amount of O adsorbed to Ge may attain more than 10 monomolecular layers. In the case of anodic dissolution, an oxide layer forms which is cathodically reduced at $\psi = -0.75$. There are 3 figures and 3 non-Soviet references.

PRESENTED:

June 8, 1960, by A. N. Frumkin, Academician

SUBMITTED:

June 8, 1960

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YEFIMOV, Ye.A.; YERUSALIMCHIK, I.G. (Moscow)

Anodic dissolution of silicon in hydrofluoric acid. Zhur. fiz. (MIRA 16:7)

(Silicon) (Hydrofluoric acid) (Electrochemistry)

5 4600 1043, 1145, 1273

s/076/61/035/003/006/023

AUTHORS:

Yefimov, Ye. A. and Yerusalimchik, I. G.

TITLE:

Anodic dissolution of germanium in the presence of reducing

agents

PERIODICAL:

Zhurnal fizicheskoy khimii, v. 35, no. 3, 1961, 543-547

TEXT: The authors studied the mechanism of anodic dissolution of thin germanium electrodes on addition of reducing agents such as C204 or I.

electrode used was a germanium lamina with a resistivity of 20 Ω cm and a \hat{u} iffusion length of 1 mm. The germanium lamina was 200 μ thick. On one side of the germanium lamina, a p-n electron transition was produced by alloying with indium. The potential of this germanium electrode with respect to a saturated calomel electrode was determined for various current densities at 20°C. All polarization curves obtained in the presence of reducing agents showed a distinct limiting current with potentials more positive than 0.5 v. The authors discussed the mechanism of accelerated germanium dissolution on addition of a reducing agent. Experimental data showed an additional supply of holes from the lower semiconductor layers to its surface in the Card 1/2

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8/076/61/035/003/006/023 B121/B203

Anodio dissolution ...

presence of reducing agents. Electrons are injected in germanium during the oxidation of reducing agents. This produces an electric field permitting the supply of holes from the interior of the semiconductor to the surface. This accelerates anodic dissolution. The increase in the saturation current is higher on addition of I ions than of ${\rm C_2O_4^{2-1}}$ ions to the solution.

This circumstance is due to partial reversibility of the reduction of molecular iodine according to Gerisher and Beck's mechanism (Ref. 3: J. Phys. Chem. (N. F.), 13, 389, 1957). There are 3 figures and 4 references: 2 Soviet-bloc and 2 non-Soviet-bloc. The two references to English-language publications read as follows: Gerisher, Beck, J. Phys. Chem. (N. F.), 13, 389, 1957; Shockley, Bell, System Tech. J., 28, 435, 1949.

SUBMITTED: June 19, 1959

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S/076/62/036/001/008 '017 B 107/B110

AUTHORS:

Yefimov, Ye. A., and Yerusalimohik, I. U. (Moscow)

TITLE:

Study of the surface condition of anodically polarized

germanium in acid solutions

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 1, 1962, 98 - 102

TEXT: The surface condition of a germanium anode has been studied at a current density of 10^{-5} to 10^{-1} a/cm² in 0.1 N H₂SO₄ at 20° C. All the experiments were made with polycrystalline, non-semiconductive, degenerate germanium with an impurity concentration of nearly 0.01%. Preliminary tests have shown that germanium of this type behaves in anodic dissolution like p-type germanium. The charge curves were measured with an 3H0-1 (ENO-1) oscilloscope. The germanium electrode was anodically polarized at different current densities for some time, whereupon the φ -Q curve was recorded at a cathode current density of 10^{-5} a/cm². The germanium electrode was etched in Γ P-4 (SR-4) before each experiment. In addition,

Study of the surface condition ...

S/076/62/036/001/008/017 B107/B110

its resistance and capacitance were determined between 60 and 5000 cps. It has been found that an electrochemically adsorbed layer of oxygen is formed on the germanium surface at a potential less than 0.38 v. The layer has a thickness of about 2 - 13 oxygen atoms, which is independent of the potential and of the time of polarization. A monomolecular layer of a defined compound of one germanium atom per oxygen atom starts forming above 0.38 v. This monomolecular layer exhibits a high resistance and can be entirely dissolved cathodically. At 0.57 v and more, thick, macroscopically detectable layers of GeO, the thickness of which grows with the potential and with the duration of polarization, are formed on the germanium surface. The oxide is not completely dissolved by cathodic polarization. The potential required for the separation of oxygen on it is higher than on pure germanium. There are 5 figures and 5 references: 1 Soviet and 4 non-Soviet. The two references to English-language publications read as follows: D. Turner, J. Electrochem. Soc., 103, 252, 1956; J. Law, P. Meigs, Semiconductor Surface Physics, N. Y., 1957, 2.383.

SUBMITTED: April 6, 1960

Card 2/2

APPROVED FOR RELEASE: 03/15/2001 CIA-RDP86-00513R001962910017-5"

Oxidation of germanium surface ...

S/076/62/036/004/005/012 B101/B110

of the Ge electrode after etching for 15 sec were measured, and also the quantity of electricity (coulomb/cm²) required for removal of the oxygen bound to the Ge surface after etching the sample for 5, 10, 15, 30 or 60 sec. Results: (a) on the germanium surface, each of the etching agents formed oxide films of a structure and composition specific to the etching agent; (b) the most homogeneous film is formed by the ${\rm H_2O_2}$ etching agent

no. 4; the charging curve of Ge treated with this etching agent shows a clearly horizontal course for y = -0.3 v; (c) with the exception of the etching agent no. 4, the specific effect of all etching agents is lost after 1-4 hrs exposure to air. The quantity of electricity necessary for reducing the oxide film was $4.3 \cdot 10^{-3}$ after 1 hr exposure to air; $5.0 \cdot 10^{-3}$ after 2 hrs; and $5.8 \cdot 10^{-3}$ coulomb/cm² after 4 hrs, from which the formation of GeO_2 , which is reduced at $y \approx -0.2$ v, may be inferred, this being in good agreement with R. J. Archer (J. Electrochem. Soc., 104, 619, 1957). There are 4 figures and 1 table.

SUBMITTED: : June 30, 1960

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